

ABSTRACT OF THE DISCLOSURE

A BJT operating as a mixer has its collector biased at the knee of the I_C vs V_{CE} characteristic. A local oscillator voltage is applied to the base and an RF signal voltage is applied to the collector through a singled-ended emitter follower. The nonlinear curvature at the knee produces a beat frequency current. The base of the emitter follower can be fed from a current mirror or through an ohmic resistor. This mixer requires less supply voltage, and results in more conversion gain and less feed-through of the RF input signal than the Gilbert multiplier. Alternatively, the RF voltage can be applied to the gate and the local oscillator voltage can be applied to the drain. Sometimes, it is more desirable to invert the collector and the emitter, or to connect a normal transistor and an inverted transistor in parallel to optimize conversion gain.

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